REMARKS

Claims 1-24 are pending in this application, all of which stand rejected as a result of the December 29, 2005 Office Action. In particular, claims 1-24 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,233,668 (Harvey). Following entry of the amendment, claims 1, 5, 6, 7, 10, 13, 14, 19, and 23 will have been amended.

Applicants respectfully submit that the claims, as amended, are in condition for allowance, for the reasons set forth below.

Applicants have amended each of the independent claims. Each independent claim, as amended, sets forth the relationship between a page table (or page, or address translation structure) and a shadow. For example, claim 1 defines at least two tables: a "one of [a] plurality of page tables" and a "first shadow page table". As amended, claim 1 defines the relationship between these two tables as follows: "wherein an item of software uses said page table to perform a non-address-mapping action that depends on data that a characteristic that is present in said one of the plurality of page tables but not present in said first shadow page table." Similar language has been added to independent claims 5, 14, and 19.

The amendatory language referred to above explains that an item of software uses the page table (i.e., the non-shadow page table) to perform some non-address-mapping action that depends on a characteristic of that page table. The characteristic that the action depends on is not present in the shadow page table. Applicants note that the act of taking a checksum, as described in paragraphs 0005, 0019 and 0046, is one example of a non-address-mapping action that depends on a characteristic of the page table that is not present in the shadow page table – i.e., the characteristic, in this case, is the checksum, and, if a page table and its shadow contain different data, they are likely to contain different checksums. Applicants note that the checksum example is merely one non-limiting example of the type of action referred to in the language that has been added to independent claims 1, 5, 14, and 19.[1]

[1] Additionally, applicants note that, in the course of computing a checksum (or performing some other non-address mapping action), it may be necessary to read or write data stored at a virtual address, which involves the translation of a virtual address. Although computing a checksum is a non-address-mapping action (i.e., computing a checksum is not the same as mapping between a virtual address and a physical address), virtual address translations, and other routine memory-management-related operations, can occur in the course of executing such non-address-mapping action.

The Harvey reference is directed to "concurrent page tables." In Harvey each page table includes a "plurality of substructures." (Harvey, col. 4, l. 10.) As explained by Harvey, "Each substructure is a constituent page table that coincides in virtual-address space with other constituent page tables but is materialized in different physical-address locations, whose contents are not in general identical to those of other constituents." (Harvey, col. 4, ll. 11-15.) The Examiner's position is essentially that one of the substructures corresponds to the claimed "shadow."

As explained in the present application (see paragraph 0005), a problem addressed herein is that, as software executes, data gets written into the address translation map. The data may have some value other than its use for performing address translations (e.g., a checksum can be taken over the data in order to verify consistency), and thus it may be useful to preserve the data in tact. However, for other reasons, it may be desirable to use a different (or somewhat modified) address translation map than the one into which the data has been written. Thus, the shadow can be used for address translation, while the original map is still available for other types of actions. This relationship between the original map and the shadow is not present in Harvey.

Thus, applicants respectfully submit that the independent claims, as amended, patentably define over Harvey, and that the dependent claims are patentable at least by reason of their dependency.

Explanation of Certain Amendments

In addition to the amendatory language described above, applicants have made certain claim amendments to address minor typographical oversights. These amendments do not affect the meaning or scope of the claim language. In particular:

- In claim 1, an extraneous use of the word "a" has been omitted, and certain instances of the label "first" have been deleted in order to make the claim language consistent throughout.

- In claims 5, 6, 7, 10, and 13, the phrase "address translation structure" has been changed to "address translation data structure" in order to make the usage of the latter term consistent throughout.

- In claim 23, a spelling error in the word "plurality" has been corrected.

No New Matter

The amendments do not constitute new matter. As noted above, certain amendments have been made to correct minor typographical oversights, and do not affect the scope or meaning of the claims. The other amendments (i.e., the amendments to claims 1, 5, 14, and 18 concerning the relationship between the page table, page, or address translation structure, and its shadow) are supported at least at paragraphs 0005, 0019,and 0046 of the original specification.

Conclusion

For all of the foregoing reasons, applicants respectfully submit that this case is in condition for allowance.

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